

**Improving Water Quality by Developing, Implementing and
Field Testing Innovative Methods
FY 03 CWA 319(h)
TSSWCB Agreement No. 03-10**

Quarter no. 6 From 1/01/05 Through 3/31/05.

I. Abstract

Technology implementation and optimization were the main focus of the sixth quarter. Although both technologies faced difficulties in equipment availability, weather interferences and system operation, both eventually established their systems on dairies and have either been sampled or will be sampled within the next quarter. Additionally, project personnel are looking towards releasing RFP for the year two technology selection.

II. Overall Progress and Results by Task

TASK 1: Demonstration and Evaluation of New Technologies

Subtask 1.1: Identification of potential technology providers. TCE, TWRI, TFB, dairy industry representatives, EPA Region 6, TSSWCB, TCEQ, BRA, NRCS, and TAES will identify and select promising technologies represented by willing technology providers. (month 1 thru 3)

The following actions have been completed during this reporting period:

- a. The two technologies currently being evaluated for year one include:
 - 1) “Electrocoagulation Technology” proposed by Ecoloclean Industries, Inc. (Huntsville, TX)
 - 2) “Phosphorus Removal by Chemical Precipitation and Geotube[®] Dewatering” proposed by Miratech Division (Commerce, GA)
- b. RFP to select year two technologies will be released within the next quarter.

33% Complete

Subtask 1.2: Identification of dairy cooperators in the North Bosque watershed area that use a flush system and lagoons to remove, store, treat, and land-apply effluent (manure and process-generated wastewater). TCE, TSSWCB and TFB will identify dairy operations willing to participate in these demonstrations. (month 1 thru 3)

The following actions have been completed during this reporting period:

- a. The two technologies will be implemented at the following dairies:
 - 1) “Ecoloclean” – OSVE Dairy (proprietor – Mr. Bert Velson), Bosque Watershed.
 - 2) “Geotube” – Triple X Dairy (proprietor – Mr. Wayne Moermen), Leon Watershed.
- b. Year two RFP will request technology providers identify options of a dairy cooperator when submitting proposal.

33% Complete

Subtask 1.3: On-site installation and start-up of the six pilot-scale technologies to be demonstrated. Technology providers will carry out the task of equipment transport, on-site installation, set-up, and start-up. With permission from the cooperating dairy owner/operator,

the technology provider will prepare the site to install and operate the system for demonstration. (First installation by August 2003, last installation 6 months before the end of the 3-year project)

The following actions have been completed during this reporting period:

- a. Implementation and planned initial sampling process of “Geotube” took place on 3-15-05 and 3-16-05. Several factors, however, delayed the initial sample collection for analysis.
 - 1) Initial technology start up progressed smoothly, but became difficult at the separation phase of the project. See Figures 1 and 2.
 - 2) General Chemical, a partner in the “Geotube” technology, did not provide the correct chemicals and personnel on-site were unable to discern necessary chemical amendments and slurry flow metering to achieve successful separation.
 - 3) As a result, TAES/TCE provided alum for the technology. However, the polymer provided by “Geotube” was still inadequate in achieving separation.
 - 4) Further, a pipe within the technology structure was unclamped during operation and drenched the TAES/TCE Doppler flow meter. Flow meter was sent to manufacturers for repair, and it is determined that the unit will be unoperational. See Figure 3.
- b. “Geotube” requested a delay in sampling to correct the chemical malfunctions.
- c. Project personnel conducted a second sampling trip on 3-30-05 and collected samples from the “Geotube” Technology and submitted the samples to TIAER for analysis.
- d. “Geotube” technology is scheduled to be sampled once a week for the next 9 weeks.
- e. “Ecoloclean” experienced numerous problems in reaching optimum system operation.
- f. “Ecoloclean” continued to work on their system and contacted TCE on 3-29-05 that the system was reaching optimization and following some internal sample analysis, the technology should be ready for sampling by mid April.

20% Complete

Subtask 1.4: QAPP preparation and field data collection and analysis.

TCE will prepare the DQO and QAPP (August 2003 to August 2004)

100% Complete

TCE will collect samples from raw and treated effluent and resulting sludge. One of the evaluation tasks will be to analyze the sludge or by-product remaining after raw material treatment for P stability (August 2003 to May 2006)

The following actions have been completed during this reporting period:

- a. As stated in task 1.3, “Geotube” technology had its first round of sample collection on 3-30-05 and will be sampled each week for the next 9 weeks.
- b. TIAER received samples with appropriate COC form. Discrepancies were noted by Mr. Mark Murphy regarding a missing sample bottles in a few of the treatments. Fortunately, ample volume of sub-samples is collected to provide TIAER with representative composite samples regardless of missing samples. Additionally, TIAER provided suggestions to improve future sample submission.
- c. Reporting units for solid samples listed in approved QAPP were incorrect and as a result, an amendment to the project QAPP was submitted to TSSWCB.
- d. Mr. Ron Jones, research associate hired to assist in sample collection, requested to vacate his position. He has agreed to assist on an ‘as needed’ basis.
- e. Dr. Scott Keating, TWRI, was hired to provide sampling assistance on a regular basis.

10% Complete

Subtask 1.5: Develop reports and outreach education materials. TCE in cooperation with TWRI will produce educational brochures and publications on effectiveness of this innovative technology. Quarterly and final reports will be prepared and submitted in a timely manner.

The following actions have been completed during this reporting period:

- a. Dairy Technology Tour is scheduled for 4-26-05. "Geotube" will be demonstrated as part of the tour and preliminary data will be presented to participants. Announcement of tour will be sent to the Advisory Committee during the next quarter. Tour may also serve as an opportunity for Advisory Committee to discuss year two RFP and future technology selection.
- b. Submitted Year 2, quarter 2 report to TSSWCB on 4-15-05

60% Complete

III. Related Issues/Current Problems and Favorable or Unusual Developments

Although technology implementation and evaluation has been a challenge for this project, it has been beneficial for both the providers and the dairy producers. First, many of these technologies have little field experience and only have operated in a laboratory setting. However, this project provides these technologies an opportunity to attempt operation in the field. Second, implementation on-site exposes technology providers to common dairy operations, characteristics of waste material and the potential setbacks of the environment. Third and perhaps one of the most beneficial impacts, dairy producers have the opportunity to learn about these technologies as a third party. Time, equipment and money are all saved as this project can identify and repair many of these technology's 'glitches' before a system becomes fully operational.

IV. Projected Work for Next Quarter

The following will be accomplished during the coming quarter:

- a. Dairy technology tour field day will be held on 4-26-05 in the Leon River Watershed. "Geotube" will be demonstrated and preliminary data presented to participants.
- b. "Ecoloclean" technology will be sampled during the next quarter.
- c. RFP for year two technologies will be released.
- d. Distribute proposals received to advisory committee for rank and selection of technologies.
- e. Scope of work will be amended as current scope of work identifies specific technologies and new or unknown technologies may be selected in response of year two RFP.



Figure 1. Geotubes and impervious material being placed on Triple X Dairy site.



Figure 2. Pump and chemical metering system to mix chemicals into lagoon effluent being pumped in to Geotubes.



Figure 3. Waste material drenched on monitoring equipment from unclamped hose.